



Reply To: 3420

Date: FEB 12 1986

Subject: Western Spruce Budworm Survey Results
and Recommendations, 1985

To: Forest Supervisor, Gila National Forest

During August and September 1985, Forest Pest Management entomologists conducted aerial and ground surveys to evaluate the status of western spruce budworm (WSB), Choristoneura occidentalis Free., on portions of the Gila NF. Survey objectives were: to determine the extent and relative intensity of defoliation throughout the susceptible host type; and to collect WSB egg mass data to use in predicting 1986 defoliation. Egg mass data were only collected in selected areas in the Reserve RD (your letter dated July 17, 1985). The purpose of this letter is to report results of these surveys to you, and to present management alternatives and recommendations.

The extent and relative intensity of defoliation was determined during our annual aerial sketchmap surveys. Results of these surveys show light to moderate defoliation occurred over 5900 acres on the Gila NF in 1985 (Figures 1 and 2). Most of this defoliation was located south of Bear Wallow Mountain and along the northeast slope of the Mogollon Mountains. The following table summarizes aerial survey results by reporting unit and severity:

Reporting Unit	Light	Medium	Heavy	Totals
Black Range RD	560	60	0	620
Reserve RD	360		0	360
Glenwood RD	1520		0	1520
Wilderness RD	3400		0	3400
Gila NF Totals	5840	60	0	5900

WSB egg mass density data were collected from 24 sample plots located in the Bear Wallow/Willow Creek area. Egg mass densities from these plots (shown in Table 1) averaged 10.5 (± 2.4) per square meter of foliage. Similar egg mass densities in 1976 (9.9 egg mass/m²) and 1977 (10.5 egg mass/m²) from plots in the same general areas were followed by light to moderate defoliation. Based on this past outbreak information and on current egg mass densities, we predict light to moderate defoliation will again occur over the Bear Wallow/Willow Creek area in 1986. Localized 'pockets' of heavy defoliation can be expected where egg mass densities exceeded 20.0 per square meter of foliage.





Western spruce budworm management alternatives generally include: No action; direct suppression (a short-term alternative); and silvicultural management (a long-term alternative). Under the no action alternative, the existing outbreak would be allowed to run its natural course. Annual defoliation and subsequent damages can be expected until the infestation collapses from natural controls such as: insufficient foliage to maintain the population; unfavorable weather conditions; heavy predation and parasitism; a microbial epizootic; or a combination of these factors. Continued defoliation within the infested areas could affect numerous Forest resources including timber, recreation, water quality, and wildlife habitat. These effects, which vary with stand susceptibility and outbreak duration, are often difficult to predict and quantify. During extended outbreaks, damages to timber resources in vulnerable stands may approximate or exceed the following estimates:

<u>Tree Damage</u>	<u>Maximum Average Damages (Percent)</u>
Growth Loss	30
Understory mortality	25
Sawtimber mortality	5
Top-kill	25
Cone crop reduction	90 ⁺
Christmas tree use reduction	90 ⁺

Over large areas of highly susceptible stands where WSB outbreaks have been continuous for the past several years, direct suppression, by aerial and/or ground application of insecticides, can reduce WSB populations over a given treatment area for 1 to 2 years, and possibly prevent tree damages for an additional 3 to 5 years. In other areas, such as Bear Wallow/Willow Creek, where stand susceptibilities appear relatively low and outbreaks are less frequent, shorter-lived and more limited in area, direct suppression may reduce WSB populations and prevent tree damages for a longer period of time. In either case, the susceptibility of existing stand conditions is unchanged and future outbreaks are very likely.

The silvicultural management alternative is a long-term strategy aimed at reducing stand susceptibility and vulnerability in commercial timber lands through silvicultural treatments implemented during scheduled timber sales. These treatments include, but are not necessarily limited to:

1. Intermediate cuttings, such as commercial or precommercial thinning, and sanitation/salvage to remove most susceptible species while regulating stocking, increasing stand vigor, and favoring nonhost tree species.
2. Regeneration cuttings, using the clearcut and shelterwood methods, designed to favor establishment of nonhost or seral species and to create a mosaic of more evenaged stands with a lower percentage of susceptible and vulnerable species.
3. Artificial regeneration with nonhost tree species.

Specific cutting strategies are presented in FSH 2409.26a.





Historically, WSB outbreaks on the Gila NF have been infrequent; short in duration, collapsing from natural factors after a few years of light to moderate defoliation, and resulted in no documented damages. This scenario is, in part, due to the apparent low to moderate susceptibility of mixed conifer stands on the Forest. Since we expect the current outbreak to follow a course similar to the historic WSB outbreaks, we recommend the no action alternative be taken over most areas currently infested.

While the direct suppression alternative could effectively reduce present WSB populations over most, if not all, portions of the currently infested area, we do not recommend direct suppression at this time. Rather, we suggest you conduct an environmental analysis to determine if, and where, management objectives, economic considerations, and public concerns might warrant management action. As part of such an analysis, we could assist in predicting outbreak trends, possible resource impacts, and management alternative formulation.

Although past WSB outbreaks on the Gila NF have been short-lived and have resulted in minimal damage, future outbreaks could occur more often and result in increased damage if mixed conifer stands are not managed to achieve and maintain low susceptibility to WSB. Therefore, we recommend the silvicultural management alternative for all stands where opportunities for silvicultural treatments exist.

DOUGLAS L. PARKER
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Table 1.--WSB egg mass densities and defoliation predictions,
Gila National Forest, 1985.

Plot #	Egg Mass Density	Predicted Defoliation in 1986
1	0.0	Undetectable
2	3.0	Light
3	8.0	Light
4	1.5	Light
5	4.8	Light
6	4.1	Light
7	18.7	Moderate
8	6.8	Light
9	36.9	Heavy
10	17.0	Moderate
11	0.0	Undetectable
12	0.0	Undetectable
13	2.1	Light
14	43.4	Heavy
15	4.2	Light
16	16.6	Moderate
17	0.0	Undetectable
19	2.1	Light
20	14.3	Moderate
21	24.2	Heavy
22	14.2	Moderate
23	9.2	Moderate
24	17.8	Moderate
25	3.2	Light

$\bar{X} = 10.5 (\pm 2.4)$

Light to Moderate



LEGEND

- L WSB Defoliation
- Egg Mass Plot location
- 1-25



Figure 1.--WSB defoliation and egg mass plot location, Gila National Forest (N/2), 1985.

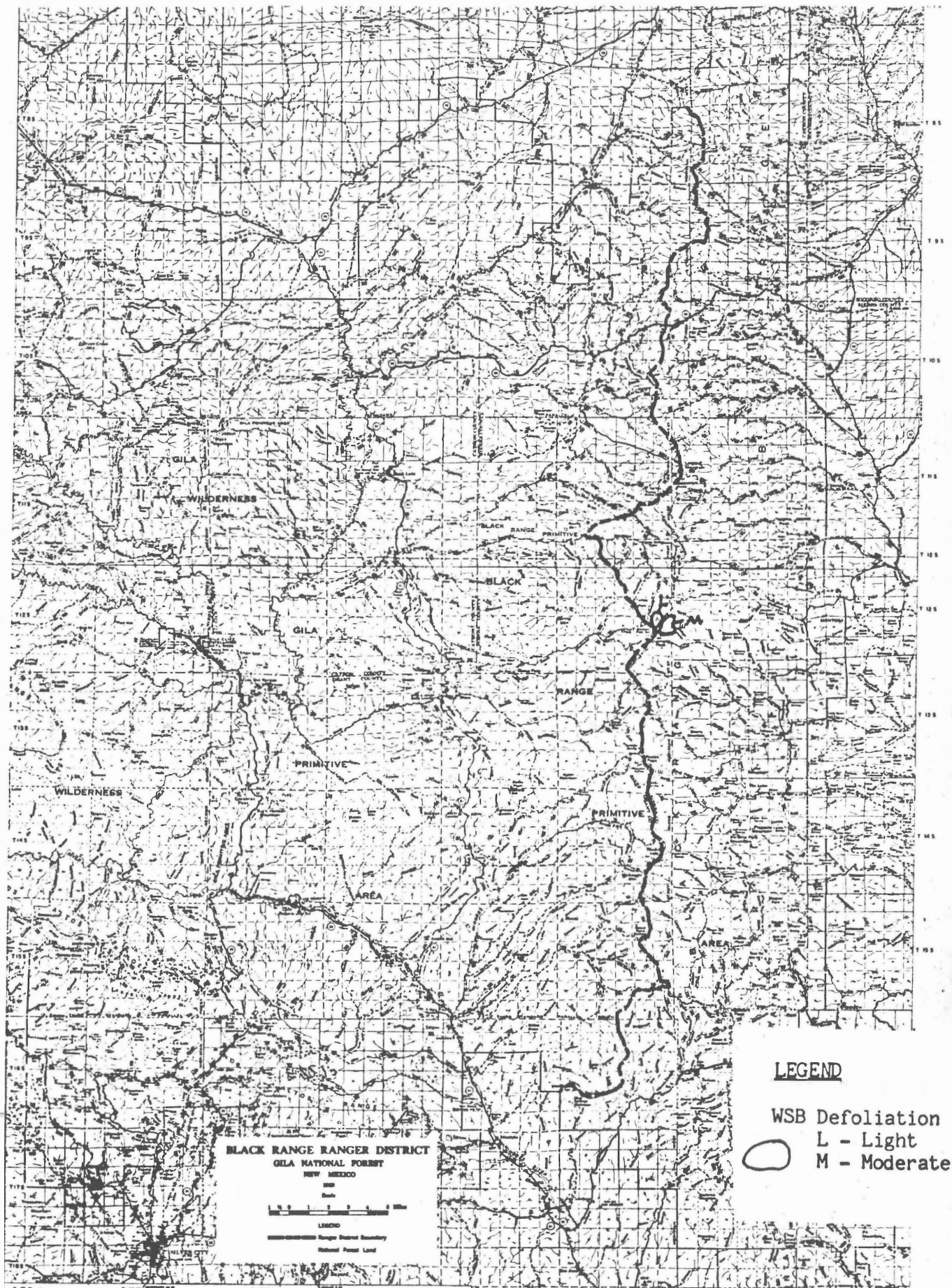


Figure 2.--WSB defoliation, Gila National Forest (S/2) 1985.